

Amendments to the Claims:

Please cancel claim 23, amend claims 1, 16-17, 22 and 24 and enter new claims 26-38. This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A process for producing hydrogen from anaerobically digested organic materials comprising ~~the steps of:~~

~~placing said materials in a reaction zone; and~~

applying an intermittent electric potential across said materials; ~~thereby producing to produce~~ hydrogen and carbon dioxide ~~whereby said electric potential is applied occasionally after periods without application of said electric potential.~~

Claim 2 (original) A process as in Claim 1 in which said ~~occasional~~ intermittent application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed.

Claim 3 (original) A process as in Claim 1 wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

Claim 4 (original) A process as in Claim 1 in which said ~~occasional~~ intermittent application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed and wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

Claim 5 (original) A process as in Claim 1 in which said electric potential is applied across electrodes.

Claim 6 (original) A process as in Claim 1 in which said electric potential is applied across multiple electrodes.

Claim 7 (canceled)

Claim 8 (canceled)

Claim 9 (canceled)

Claim 10 (canceled)

Claim 11 (canceled)

Claim 12 (canceled)

Claim 13 (canceled)

Claim 14 (canceled)

Claim 15 (canceled)

Claim 16 (original) A process for producing hydrogen from anaerobically digested organic materials comprising the steps of:

~~placing said materials in a reaction zone; and~~ applying an intermittent electric potential across said materials; ~~thereby producing~~ to produce hydrogen and carbon dioxide ~~whereby said electric potential is applied occasionally after periods without application of said electric potential whereby~~ wherein the amount of time required to reduce the amount of said organic materials is substantially reduced compared to the time required without application of said electric potential.

Claim 17 (currently amended) A process for conversion of biomass wastes into useful energy comprising the steps of:

~~application of~~ applying an intermittent voltage ~~to for purposes selected from the group including depression of~~ depress microorganismal activity that produces methane, ~~enhancement~~

~~of microorganismal activity that produces~~ enhance production of hydrogen, or ~~ereation of create~~
an atmosphere within said biomass wastes ~~that is maintained~~ rich in hydrogen.

Claim 18 (canceled)

Claim 19 (canceled)

Claim 20 (canceled)

Claim 21 (canceled)

Claim 22 (currently amended) The process of claim 17 in which an inoculum ~~means~~
selected from the group ~~including~~ consisting of:

human sewage, medium from a mature anaerobic digestion of organic materials
performed as in claim 17 ~~within an occasionally applied voltage~~, and medium from an anaerobic
digestion that is conducted in the presence of increased concentrations of ~~hydrogen~~, hydrogen;
~~wherein said inoculum~~ is added to substantially organic materials selected from the group
~~including~~ consisting of: manure, crop wastes, and ~~garbage~~, garbage;

~~for purposes of increasing the efficiency of conversion of chemical potential energy in~~
~~organic materials to hydrogen.~~

Claim 23 (canceled)

Claim 24 (currently amended) A process for converting organic materials into a gaseous
fuel, said process comprising ~~the steps of~~ anaerobically digesting organic materials in the
presence of an intermittently applied electrical potential ~~potential, intermittently or occasionally~~
~~applied~~ to produce carbon dioxide and a gaseous fuel comprising a mixture of hydrogen and
methane ~~hydrogen, methane, and mixtures thereof.~~

Claim 25 (previously presented) The process of claim 17 in which said intermittent
voltage is generated by a hydrogen fuel cell.

Claim 26 (new) The process of Claim 1 wherein formation of methane is suppressed.

Claim 27 (new) The process of Claim 1 wherein said electric potential is adaptively adjusted to minimize electric power consumption while maximizing hydrogen production.

Claim 28 (new) The process of Claim 1 wherein said electric potential is between 1 and 7 volts.

Claim 29 (new) The process of Claim 1 wherein said electric potential is between 3 and 6 volts.

Claim 30 (new) The process of Claim 1 wherein said electric potential is between 3.0 and 4.5 volts.

Claim 31 (new) The process of Claim 1 wherein said electric potential results in an electric current having low polarization.

Claim 32 (new) The process of Claim 1 wherein said electric potential results in an electric current having low ohmic losses.

Claim 33 (new) The process of Claim 6 wherein said electrodes are made from materials selected from the group consisting of lead, copper, steel, brass, carbon, cast iron bars, metal impregnated graphite and electrically conductive graphite.

Claim 34 (new) The process of Claim 1, wherein said electric potential comprises a voltage applied by a voltage source according to a duty cycle that is adjusted by a controller, and wherein said process comprises the additional steps of:

(i) detecting methane production by gas detection means in communication with said controller;

(ii) applying a voltage for a first time period until methane production is depressed;

(iii) discontinuing application of voltage for a second time period;

- (iv) detecting resumption of methane production by said gas detection means;
- (v) applying a voltage for a third time period longer than said first time period;
- (vi) discontinuing application of voltage across electrodes for a fourth time period shorter than the second time period in step (iii);
- (vii) repeating steps (ii) – (vi) iteratively until methane production is minimized and hydrogen production is maximized.

Claim 35 (new) The process of Claim 34 wherein said voltage is adaptively adjusted to minimize energy expenditure.

Claim 36 (new) The process of Claim 24 wherein said gaseous fuels comprise up to about 79% hydrogen gas.

Claim 37 (new) The process of Claim 24 wherein said gaseous fuels have traces of methane.

Claim 38 (new) The process of Claim 24 wherein said gaseous fuels have no methane.